CITY OF MISSOULA
BITTERROOT OUTFALL IMPROVEMENTS

The City of Missoula (City) authorized Herrera Environmental Consultants (Herrera) to prepare this scope of work and associated budget estimate to provide support for improvements to the Bitterroot Outfall of the South Hills Storm Drain System. The Bitterroot Outfall was constructed in 1986 and drains approximately 3,000 acres within the City limits, and nearly 12,000 acres in total. The outfall is a 54-inch reinforced concrete pipe with a metal flap gate. There is perennial dry weather flow to the outfall from Pattee Creek and Moose Can Gully. The outfall discharges into an approximately 300' x 50' swale until reaching the Bitterroot River. At the river, there is a 50-foot-wide concrete apron with approximately 30-foot-long wing walls on either side. Additionally, there are two rows of concrete pillar energy dissipaters located downstream of the flap gate in the swale and downstream of the concrete apron, in the Bitterroot River channel.

This facility does not appear to have been maintained since it was installed. Lack of maintenance has affected water quality: Missoula Valley Water Quality District sampling results have shown that Pattee Creek flow contributes to Bitterroot River water quality impairment. Total suspended sediment (TSS) measurements at the Bitterroot outfall were 282 mg/L. A typical picture on page 5 of this document shows a plume of sediment being discharged from the swale into the Bitterroot River. When the City inspected the site in 2019, all the energy dissipaters were covered in sediment. Crews used a vacuum truck to uncover the concrete pillar dissipaters below the flap gate. The dissipater pillars in the river channel were more heavily covered, with trees and shrubs growing on top of them amid a large volume of deposited sediment. Additionally, trees are encroaching on the wing walls and threaten the stability of these structures. The flow through the swale has become channelized and does not allow for sediment to settle out prior to reaching the river. Also, the swale lacks adequate vegetation to slow the flow, which could aid in sediment retention and provide nutrient uptake before the flow enters the river.

The system is not functioning as designed and should be upgraded to handle the increased flow rates resulting from urbanization of the drainage basin. Proposed improvements to the outfall include:

- Best Management Practices (BMPs) to address heavy loads of sediment that reach this outfall. The source of sediment is primarily due to road sanding operations in the South Hills during the winter. BMPs could include a hydrodynamic separator installed upstream of the outfall or a sediment forebay that enables sediment removal in a designated location. To facilitate maintenance of this type of BMP, a bypass channel or pipe would be installed.
- Clearing sediment from the energy dissipaters so that they are fully exposed.

- Removal of trees and vegetation that is encroaching on the facilities before damage occurs.
- Re-grading or otherwise modifying the swale so that flow meanders through and accumulated sediment can settle out.
- Additional vegetation to provide enhanced nutrient uptake and sediment deposition.
- Upgrading the undersized culvert crossing located downstream of the flap gate to accommodate the 1% annual chance flood event.

This scope of work describes the activities, assumptions and deliverables associated with the following tasks:

TASK 1– PROJECT MANAGEMENT

Herrera will manage the scope, schedule, and budget for the work described in Tasks 2-8, and coordinate with the City on a regular basis to keep the City's project manager informed about project progress, project issues, and schedule.

The anticipated duration of the project work is 24 months from contractual notice-to-proceed. The following project management work will be completed:

a. Project Schedule – Herrera will prepare an overall project schedule for the work as well as sub-schedules for completing individual tasks and update the schedule as needed as task work proceeds. Any updates to the schedule will be discussed with the City Project Manager.

b. Progress Reports & Invoices – Herrera will submit monthly invoices and progress reports. The progress reports will include descriptions of the progress to date on each task.

c. Conduct a kick-off meeting with the City's project team (via conference call). Herrera will prepare an agenda and meeting minutes. Kick-off meeting will be an approximately 60-minute conference call, attended by City staff and up to four staff from the Consultant team.

d. Internal Team Coordination – Herrera's project manager will coordinate the work across tasks and be the main point of contact for requesting information from City staff and relaying information provided by the City.

e. Coordination with the City of Missoula – Herrera's project manager will be the main point of contact for communication and coordination with the City on this project. Coordination will include regular phone calls and in-person or conference call meetings with the City as needed to coordinate getting City staff input and review.

f. QA/QC - Herrera will perform quality assurance and quality control during development of all work product submittals.

Assumptions:

- The duration of active project work will be no longer than 24 months.
- Meetings among Consultant team members that do not involve City staff will be conducted under other tasks in this scope of work.
- Herrera will set up and maintain a project file sharing site.
- Kickoff meeting will include up to four Herrera team members (1 hour meeting)

Deliverables:

- Project Schedule (Electronic format - Microsoft Project and PDF)
- Kickoff meeting agenda and meeting notes (Electronic format - Word)
- Monthly invoices, progress reports, and budget tracking report (Electronic format - PDF)

TASK 2 – SITE SURVEY AND ASSESSMENT

Following the review of existing data for the project area, the consultant team will conduct a one-day site visit to collect additional topographic data, property survey, utility locations, and other data needed to effectively develop design concepts and evaluate alternatives for feasibility. The site visit is expected to include a basic topographic survey of the structures and swale to record their location and relative elevations, survey of property lines and easement limits, and locations and inverts of the outfall pipe and upstream structure. Herrera will also conduct a qualitative geomorphic assessment to investigate river processes associated with the proposed removal of vegetation and accumulated sediment where the swale enters the Bitterroot River. During the site visit the consultant team will delineate the ordinary high-water

mark (OHWM) of the river and wetland boundaries and survey their locations to support permitting efforts.

Assumptions:

- Site visit will be one full day for up to two (2) Herrera staff members.
- Survey will be performed by up to two (2) DJ&A staff.
- City will facilitate access to the site with landowners.
- The consultant team will collect topographic data suitable for conceptual design development and alternatives analysis using survey grade Leica Viva rover and base station or equivalent technology.

Deliverables:

- Scanned Field Notes (Electronic format - PDF)
- Survey data files to import into CAD (Electronic format – CAD)

TASK 3 – ALTERNATIVES ANALYSIS

The purpose of this task is to identify alternatives for upgrades to the Bitterroot Outfall system and evaluate them against each other to inform selection of a preferred alternative. The goal of this task is to determine the level of repair, improvement, and/or replacement required to optimize settling/removal of sediment and flow control at the outfall, swale, and discharge weir, and to ensure continued safe and reliable functioning of the system.

Herrera will review existing documentation and data for the Bitterroot Outfall, provided by the City. Existing documentation and data will include as-built drawings, reports, surveys, sampling data, and other available information.

Herrera will identify potential repairs, improvements, and/or replacement features based on proven methods that are suited to the site setting, City operations and maintenance input, and other considerations.

Alternatives will be presented during a workshop meeting with the City, and a preferred alternative will be recommended. Herrera will:

1. Develop and complete an Evaluation Criteria Matrix and an evaluation ranking system, which will include consideration of feasibility, potential environmental impacts, cost, and other potential impacts.
2. Identify and evaluate alternatives using the Evaluation Criteria Matrix.

3. Develop a conceptual layout figure for each alternative.
4. Develop a conceptual cost estimate for each alternative.
5. Prepare Preliminary Engineering Report (PER), including:
    a. Background information, including planning, existing facilities, and need for the project
    b. Alternatives considered
    c. Alternative evaluation criteria
    d. Conceptual design plans for the recommended alternative
    e. Conceptual cost estimates for the recommended alternative
    f. Montana Department of Natural Resources and Conservation (DNRC) environmental checklist

Each alternative, and the rationale for the preferred alternative identified during the workshop, will be documented and detailed in the PER that meets the requirements of the DNRC and Montana Department of Environmental Quality (DEQ).

Assumptions:

- Existing documentation and data will include as-built drawings, reports, surveys, sampling data, and other available information. The City will provide Herrera with original outfall design documentation, if there is more than what is included on the City's online GIS portal
- The City will provide Herrera with hydrology data for the outfall including a summary of peak and base flow rates.
- The City will provide road sand specification, along with any other data on the particle size and type of sediment coming through the outfall.
- The alternatives analysis will include identification of appropriate public outreach efforts.
- This task will include a PER that meets the requirements of MT DEQ.
- The PER will include enough information for the MT DEQ to determine if an Environmental Assessment (EA) is needed.
- If an EA is needed, DEQ will prepare it based on the PER produced by Herrera.
- Herrera staff will participate in one public meeting, which will be led by Herrera. Herrera will provide support on technical information and answers to public questions.
- The City will provide review and a consolidated, conflict-resolved set of comments on draft deliverables within two (2) weeks of submittal. Comments on the draft deliverables will be incorporated into the final deliverable.

Deliverables:

- Draft and Final Preliminary Engineering Report (Electronic – PDF and Word).

TASK 4 – PERMITTING

Herrera will provide permitting assistance to the City and will prepare project documentation, as required, to meet applicable local, state, and federal environmental regulatory compliance reviews and authorizations, as outlined in Table 1. Federal and state environmental regulatory compliance authorizations will be dependent on the extent of potential impacts to existing wetland and stream conditions and associated habitats. After preparing permit-ready design plans in Task 5 and potential impact analysis in this task, Herrera will coordinate a pre-application meeting with regulatory agencies at the draft Joint Application review stage to review jurisdictional determinations and applicable mitigation requirements.

MT DEQ will make the Montana Environmental Policy Act (MEPA) determination based on the PER. Herrera is anticipated to be the lead agency for coordinating the MEPA process with MT DEQ and providing comment response.

Table 1. Environmental Regulatory Compliance and Authorizations by Agency

Authorizing Regulatory Agency	Permit/Authorization	Required Documentation to be Prepared by Herrera
City of Missoula	Floodplain permit	Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains and Other Water Bodies (Joint Application)
Montana Fish, Wildlife, and Parks (FWP)	Montana Stream Protection Act (SPA 124)	Joint Application
Montana Department of Environmental Quality	318 Turbidity Authorization 401 Water Quality Certification	Joint Application
U.S. Army Corps of Engineers (USACE)	Sections 404/401 Clean Water Act Section 7 Endangered Species Act	Joint Application, Wetland and Waters of the U.S. Report, and Design Site Plans Biological Assessment or No Effect Letter
Montana Department of Natural Resources	Montana Environmental Policy Act (MEPA)	Environmental Checklist

and Conservation (DNRC)		

Projects requiring federal authorization through the U.S. Army Corps of Engineers (USACE) according to Sections 404 and 401 of the Clean Water Act (CWA) also require consultation with the U.S. Fish and Wildlife Service (USFWS) for compliance with Section 7 of the Endangered Species Act. Water Quality Certification for compliance with Section 401 of the CWA is administered by the Montana Department of Environmental Quality on behalf of the U.S. Environmental Protection Agency.

Based on the developed nature of the project areas within road right-of-ways and utility corridors and adjacency to residential yards, the potential for cultural resources to be present within the project limits is low, and therefore requirements for a formal study beyond general descriptions and/or construction monitoring are not likely to be required. Design site plans will be provided in a format that meets the Joint Application submittal requirements of the agencies.

Assumptions:

- Herrera will be the lead agent for MEPA compliance review and documentation.
- Cultural resources study, if required, will be performed by others.
- The City will provide one set of review comments for each draft deliverable for Herrera to incorporate into the final document
- Herrera will work as the authorized agent on behalf of the City for non-city permit submittals

Deliverables

- Draft and Final Joint Application (Electronic – PDF)
- Wetlands and Waters of the U.S. Report (Electronic – PDF)
- Draft and Final Biological Assessment or No Effect Letter (Electronic – PDF)

TASK 5 – CONCEPTUAL DESIGN

Herrera will develop design plans, a table of contents for construction specifications, and a cost estimate for construction of the recommended alternative identified in the Task 2 Alternatives Analysis. Drawings and cost estimate will be prepared to a 60 percent level of completion to be used as a baseline for the project.

Herrera will:

- Provide 60% complete design drawings, addressing City comments on the alternatives analysis conceptual design, and a refined cost estimate for construction the Bitterroot Outfall improvements.
- Provide Table of Contents for Technical Specifications to be written for the construction contract.

Assumptions:

- The City will provide one consolidated, complete set of comments for each design submittal. Allow ten (10) working days for project team review.
- City comments on the conceptual design from the alternatives analysis will be incorporated into the 60% complete design deliverable.
- Cost Estimate will include:
    - Major work items with detailed line item pricing for materials and construction costs. Cost estimates will be prepared using CSI Uniformat.
    - Estimate to be prepared with a 20% build contingency and a 10% additional contingency to account for current market volatility.
- Structural engineering design services will not be required.
- The City will provide Herrera with hydrology data for the outfall including a summary of peak and base flow rates.
- The City will provide road sand specification, along with any other data on the particle size of sediment coming through the outfall.
- The City will provide review and a consolidated, conflict-resolved set of comments on 60% complete design documents within two (2) weeks of submittal. Comments on the 60% design deliverables will be incorporated into the final design documents produced in Task 6.

Deliverables:

- 60% Complete Design Drawings – electronic format (PDF).
- 60% Construction Cost Estimate – electronic format (PDF).
- Technical Specifications Table of Contents – electronic format (PDF).

TASK 6 – FINAL DESIGN AND CONSTRUCTION PLANS

Herrera will prepare final design and construction drawings, specifications, and a cost estimate for construction of the Bitterroot Outfall improvements. Drawings, specifications, and cost estimate will be prepared to a 100 percent level of completion. The 90% complete design package will incorporate comments from the City from the 60% design package submittal in Task 5.

Herrera will:

- Provide final drawings for the Bitterroot Outfall improvements, addressing City comments from the 60% design package.
- Provide a final cost estimate for the Bitterroot Outfall improvements, incorporating City comments from the 60% cost estimate review.
- Provide final Technical Specifications for construction.

Assumptions:

- The City will provide one consolidated, complete set of comments for each design stage. Allow ten (10) working days for project team review.
- Herrera will prepare a 90% design package and a 100% (bid ready) final design package
- City comments on the 60% design package produced in Task 5 will be incorporated into the 90% complete design deliverable. City comments on the 90% design deliverable will be incorporated into the 100% final design package.
- Specifications will use Montana Public Works Standard Specifications and City of Missoula Standards and Specifications for all performance specifications, including a table of contents for all work applicable to technical specifications.
- The City will prepare all Division 0 and Division 1 specifications.
- Cost Estimate will include:
    - Major work items with detailed line item pricing for materials and construction costs. Cost estimates will be prepared using CSI Uniformat.
    - Estimate to be prepared with a 10% build contingency and a 10% additional contingency to account for current market volatility.

- The City will provide review and a consolidated, conflict-resolved set of comments on draft deliverables within two (2) weeks of submittal. Comments on the draft deliverables will be incorporated into the final deliverable.

Deliverables:

- 90% Design Drawings – electronic format (PDF).
- 90% Cost Estimate – electronic format (PDF).
- 90% Technical Specifications – electronic format (Microsoft Word and PDF).
- 100% Design Drawings – electronic format (PDF and AutoCAD).
- 100% Cost Estimate – electronic format (PDF).
- 100% Technical Specifications – electronic format (Microsoft Word and PDF).

TASK 7 – CONSTRUCTION ADMINISTRATION

Herrera will support the City during construction with representation during construction meetings and routine inspections to confirm construction Contractor work conforms to the Contract Document requirements. Herrera will provide the following engineering services:

- Herrera will facilitate the pre-bid meeting onsite facilitated by the City. Herrera will prepare meeting minutes.
- Written responses to bidder questions
- Bid support, including upload of the bid package, preparation of any addendums required, bid evaluation assistance
- Herrera will attend the pre-construction and baseline schedule review meeting facilitated by the City.
- Response to Requests for Information (RFIs) - Prepare written comments to respond to construction Contractor RFIs to enable the Contractor to understand the contract drawings and specifications. Review of RFIs shall be performed and completed with responses returned to the construction Contractor no later than seven (7) working days after receipt.
- Submittal review - Check and approve or reject Contractor submittals, including samples, certifications, equipment lists, schedules, shop drawings and catalog data. One copy shall be submitted to City for their records and one copy shall be returned directly to the

Construction Contractor. Completed reviews will be returned to the construction Contractor no later than ten (10) working days after receipt.

- Provide monthly review of construction Contractor's actual schedule in comparison to the base-line schedule and provide comments, to coincide with pay application.

- Attend weekly construction meetings. Herrera will facilitate meetings as the Owner's representative. Herrera will develop the agenda and meeting minutes.

- Resident Engineer support – Herrera staff will be onsite during key times for construction to verify the construction Contractor's work is in conformance with Construction Documents and that installed products and work is consistent with the approved submittals. Provide site visit summaries for days on-site, including photo documentation of the work observed.

- Field Order preparation and change order support.

- As built Survey and record drawing preparation. Herrera will review and incorporate the Contractor's red-lined drawings and as-built survey into a final as-built drawing set.

- Project close out and punchlist support.

Assumptions:

- Herrera staff will observe daily construction as the onsite Resident Engineer.
- Herrera will coordinate upload of the construction bid package to QuestCDN and will assist with preparation of addenda.
- Herrera will facilitate the pre-bid meeting.
- Herrera will be responsible for construction staking.
- Weekly construction meetings will be one (1) hour in duration and will be held at the project site. Meetings will be physically attended by one (1) Herrera staff member.
- Period of active construction during which site visits are required will not exceed 8 weeks. Herrera staff will be present during construction up to half time on site.
- Daily reports will be one-page summaries of activities documented while on-site (up to 40 daily reports).
- Up to eight (8) RFI's are anticipated with an average review and processing time of one (1) hour of labor.
- Up to ten (10) submittals will be reviewed, each requiring an average of one (1) resubmittal. Initial submittal reviews will require an average of one (1) hour of labor to review and each resubmittal will require an average of one (1) hour of labor to review.
- Up to two (2) field order and change order documents will prepared, each requiring an average of two (2) hours of labor to prepare.

- Weekly meeting minutes will be one-page summaries of agenda items and action items (up to 8 weekly meeting minutes).
- Field order preparation will require an average of two (2) hours of labor to prepare (for each of up to 2 field orders).
- The consultant team will be responsible for all compaction testing.

Deliverables:

- Pre-bid meeting agenda and minutes – electronic format (PDF).
- Weekly Meeting agenda and minutes – electronic format (PDF).
- Bidder question and RFI responses – electronic format (PDF).
- Submittal review responses – electronic format (PDF).
- Field order and change order documents – electronic format (PDF).
- Daily site inspection reports, including photo logs – electronic format (PDF).
- As-built drawings– electronic format (PDF and CAD).

TASK 8 – GRANT ADMINISTRATION

Herrera will support the City in administering the grant (including preparing and submitting documentation required by DNRC such as project reports, invoices, and grant reimbursement forms), and submitting documents and plans to DNRC. The City will serve as the primary point of contact for DNRC.

Assumptions:

- City staff will prepare and submit the grant application.
- Herrera will prepare and submit project reports and invoices. Herrera will provide information required for grant reimbursement forms.
- City staff will prepare and submit the grant reimbursement forms to DNRC.

Deliverables:

- Project Reports, as required by DNRC – electronic format (PDF).
- Invoices – electronic format (PDF).
- Project Closeout paperwork – electronic format (PDF).

SCHEDULE

Herrera is available to begin work on this project immediately and we anticipate performing this work starting in early winter 2023. An overall project duration of 24 months is assumed, with completion occurring in December 2024. A rough schedule based on receiving contractual Notice to Proceed on January 27, 2023 is as follows:

Survey:	Mar 2023
Alternatives Analysis:	Jan 2023 – Jun 2023
Permitting:	Jun – Sept 2023
Conceptual Design:	Aug - Nov 2023
Final Design:	Nov 2023 – Feb 2024
Construction Administration:	July - Nov 2024

Herrera Environmental Consultants

1/5/2023

Cost Estimate for City of Missoula - Bitterroot Outfall Improvements
Herrera Project No. 21-07621-002

Herrera Labor based on:	Burdened Labor Rates		Task No.	1	2	3	4	5	6	7	8	Total
				Project Management	Site Survey and Assessment	Alternatives Analysis	Permitting	Conceptual Design	Final Design PS&E	Construction Administration	Grant Administration	
Schedule		Task Start Date		1/13/2023	1/13/2023	2/13/2023	5/15/2023	11/15/2023	2/15/2024	8/1/2024	1/13/2023	
		Task End Date		12/13/2024	2/13/2023	5/15/2023	11/15/2023	2/15/2024	4/15/2024	10/1/2024	11/13/2024	
Staff	Title	2023 Burdened Labor Rates										
Ewbank, Mark	Vice President	$302.12		1	0	1	0	1	1	0	0	4
Houck, Heidi	Engineer VI	$229.63		60	0	11	0	13	20	5	2	111
Mitchell, Colleen	Engineer V	$228.73		0	0	8	0	48	18	0	0	74
Fidler, Matthew	Engineer III	$135.33		28	8	42	8	124	108	214	19	551
Klara, Matt	Engineer IV	$170.74		0	4	16	2	40	40	0	0	102
Wall, Susan	Scientist V	$171.78		0	4	2	58	8	14	0	0	86
Marston, Charles	CAD Technician II	$107.80		0	2	16	20	56	40	12	0	146
Fox, Michelle	Administrative Coordinator II	$97.10		0	0	6	10	0	6	0	0	22
Rudnick, Tracy	Project Accountant IV	$152.87		24	0	0	0	0	0	0	0	24
			Total Hours per Task	113	18	102	98	290	247	231	21	1120
			Subtotal Labor	$21,538	$2,668	$15,724	$14,514	$45,287	$37,756	$31,401	$3,030	$171,921
			Subtotal Herrera Labor	**$21,538**	**$2,668**	**$15,724**	**$14,514**	**$45,287**	**$37,756**	**$31,401**	**$3,030**	**$171,921**
3%			Escalation on Herrera Labor in 2024	$323	$0	$0	$0	$679	$1,133	$942	$45	$3,123
			Escalated Subtotal Herrera Labor	**$21,861**	**$2,668**	**$15,724**	**$14,514**	**$45,967**	**$38,889**	**$32,343**	**$3,076**	**$175,043**

Subconsultants

Subconsultant											
DJ&A			$0	$13,129	$0	$0	$0	$0	$0	$0	$13,129
AllWest			$0	$0	$0	$0	$0	$0	$2,040	$0	$2,040
		Subtotal Subconsultant Cost	**$0**	**$13,129**	**$0**	**$0**	**$0**	**$0**	**$2,040**	**$0**	**$15,169**

Travel and Per Diem (PD)

Item	Unit	Unit Cost									
Auto Use	Mile	$0.655	0	8	8	0	0	0	160	0	176
		Subtotal Per Diem	**$0**	**$5**	**$5**	**$0**	**$0**	**$0**	**$105**	**$0**	**$115**

Other Direct Costs (ODCs)

Item	Unit	Unit Cost									
GPS unit (Arrow 100 w/ iPad)	Day	$85.00	0	1	0	0	0	0	3	0	4
DJI Phantom 4 Pro UAV (drone)	Day	$100.00	0	0	0	0	0	0	1	0	1
UAS data processing fee	Data Set	$150.00	0	0	0	0	0	0	1	0	1
		Subtotal ODCs	**$0**	**$85**	**$0**	**$0**	**$0**	**$0**	**$505**	**$0**	**$590**
		Subtotal Per Diem, Lab Costs, and ODCs	**$0**	**$90**	**$5**	**$0**	**$0**	**$0**	**$610**	**$0**	**$705**
		Grand Subtotal	**$21,861**	**$15,888**	**$15,730**	**$14,514**	**$45,967**	**$38,889**	**$34,993**	**$3,076**	**$190,917**
		Grand Total									**$190,917**